

CLAIMS

What is claimed is:

1. A modular inductor for use in power electronic circuits, the inductor
5 comprising:
a modular enclosure having a mounting surface extending generally in a plane;
an inductor coil wound about a central axis extending generally parallel to the
mounting surface; and
a plurality of leads electrically coupled to the inductor coil and accessible from the
10 modular enclosure.
2. The inductor of claim 1, further comprising a liquid cooled base, the
enclosure being mounted to the base for conductive heat transfer through the mounting
surface.
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3. The inductor of claim 1, wherein the coil is generally oblong in a cross
section transverse to the central axis.
4. The inductor of claim 1, wherein the modular enclosure has a plurality of
20 generally flat external surfaces including side surfaces adjacent to the mounting surface, and
wherein the mounting surface has a greater surface area than any one of the side surfaces.
5. The inductor of claim 1, wherein the modular enclosure is configured for
mounting adjacent to similar modular inductors in a multi-phase inductor assembly.
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6. The inductor of claim 1, wherein the leads include plug-in terminals
configured to engage interfacing conductors of other components in a circuit in which the
inductor is incorporated for use.

7. The inductor of claim 1, wherein the leads include conductive pads for interconnecting the inductor with other components in a circuit in which the inductor is incorporated for use.

5 8. The inductor of claim 1, wherein a first lead is disposed on a first side of the modular package and a second lead is disposed on a second side opposite the first side.

9. The inductor of claim 1, further comprising a current sensor disposed within the enclosure and configured to sense current through the inductor.

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10. The inductor of claim 9, wherein the sensor is configured to sense ground faults of the inductor coil.

11. The inductor of claim 1, further comprising a capacitor wound with the inductor coil.

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12. The inductor of claim 1, further comprising a second, common mode inductor coil wound within the enclosure.

13. A modular inductor system for use in power electronic circuits, the inductor comprising:

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a modular enclosure having a mounting surface extending generally in a plane;

three modular inductors disposed in the enclosure, each inductor being configured for electrical connection to a respective phase of three phase electrical system; and

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a plurality of leads electrically coupled to the inductors for interfacing the inductors with adjacent components of the three phase electrical system.

14. The inductor system of claim 13, further comprising a liquid cooled base, the enclosure being mounted to the base for conductive heat transfer through the mounting surface.

5 15. The inductor system of claim 13, wherein each inductor includes a coil wound about an axis generally parallel to the mounting surface.

16. The inductor system of claim 13, wherein the inductors are potted within the enclosure.

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17. A power converter assembly comprising:

a power converter circuit configured to convert incoming power to controlled three-phase outgoing power;

15 a modular inductor assembly configured to be coupled between the power converter circuit and a source of electrical power, the inductor assembly comprising a modular enclosure having a mounting surface extending generally in a plane, an inductor coil wound about a central axis extending generally parallel to the mounting surface, and a plurality of leads electrically coupled to the inductor coil and accessible from the modular enclosure for coupling the inductor assembly to the power converter circuit.

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18. The power converter assembly of claim 17, wherein the inductor assembly includes three modular inductors disposed in the enclosure, each inductor being configured for electrical connection to a respective phase of three phase electrical system.

25 19. The power converter assembly of claim 18, further comprising a fluid cooled support, at least the inductor assembly being mounted on the fluid cooled support for extraction of heat from the inductor assembly via the mounting surface.

20. The power converter assembly of claim 17, further comprising a second inductor assembly electrically coupled in series with the inductor assembly, and a filter circuit electrically coupled in series between the inductor assembly and to the second inductor assembly.

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21. A power converter assembly comprising:

a power converter circuit configured to convert incoming power to controlled three-phase outgoing power;

10 a modular inductor assembly configured to be coupled between the power converter circuit and a source of electrical power, the inductor assembly comprising a modular enclosure and three modular inductors disposed in the enclosure, each inductor being configured for electrical connection to a respective phase of the power converter circuit, the enclosure having a mounting surface extending generally in a plane; and

15 a fluid cooled support, the power converter circuit and the inductor assembly being mounted on the fluid cooled support for extraction of heat from the inductor assembly via the mounting surface.